February 9, 2010

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Vice President
Government & Community Affairs

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PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street, First Floor
Kekuanaoa Building
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Docket No. 2008-0273 – Feed-in Tariff ("FIT") Proceeding
Clarification to Reliability Standards Report

Yesterday afternoon, Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, (collectively the "Hawaiian Electric Companies"), submitted for Commission consideration their proposed reliability standards for the Hawaiian Electric Companies' Feed-In Tariff Program.

Upon a detailed review of the filing, it has come to the Companies' attention that one of the numeric values contained in certain of the tables presented may be subject to misinterpretation and therefore requires clarification. Specifically, Tables 1, 2 and 7 indicate that the total percentage (relative to net system load at peak) of installed distribution level generation on the HECO system is approximately 3.34% inclusive of 30 MW of non-variable resources. The indicated value correctly reflects the current level of installed generation at the distribution level on the HECO system. However, due to the fact that the 30 MW of non-variable generation reflects distributed generation that is both firm and fully dispatchable by HECO, it should be clarified that the 30 MW does not factor into or otherwise take away from the interim system-wide distributed generation limit of 60 MW for the HECO system discussed in the filing.

The Hawaiian Electric Companies would also like to clarify that any proposals to temporarily defer interconnection of additional distribution level resources until additional study can be completed, are fully understood to be subject to the further action and direction of the Commission, inclusive of any further modification, definition, or evaluation of the Net Energy Metering program which the Commission in its discretion may undertake pursuant to Hawaii Revised Statutes Section 269-102.

Attached hereto and respectfully submitted for the Commission's consideration are replacement pages which reflect this clarification. Additionally, the Companies have attached a replacement page 9 to Exhibit 1 which correctly reflects Figure 1 on that page as Figure 1 did not print out correctly on the original filing.

Please contact Scott Seu at 543-4805 should you have any questions regarding this matter.

Sincerely,

Darcy Endo-Omoto
Hawaiian Electric Company, Inc.
Hawaii Electric Light Company, Inc.
Maui Electric Company, Limited

Attachments

c: Service List

Should Form The Basis For The Development Of Existing System Baselines And To Quantify The Impact Of Increasing Renewables On The Systems.

The ability of a utility to cost-effectively balance supply and demand is a critical measure of system reliability. Operators must constantly balance generation supply to meet demand and reserves for contingency requirements. As impacts are observed, follow-on system and local level studies must be performed to assess baselines and recommend corrective action or measures to ensure overall system reliability. As planning and scheduling are based on system maximums and operations are based on real-time response to conditions, the methodology to evaluate system reliability must consider both steady state and dynamic system impacts. For purposes of quantifying reliability on the island grid systems, steady-state excess energy (curtailment) impacts and dynamic system frequency issues are proposed as initial measures to establish existing system baselines and to quantify the impact of increasing renewables on the systems. Consequently, Reliability Standards, as defined by the Hawaiian Electric Companies, are established principles that govern the planning and operation of the electrical system to maintain the delivery of reliable power from generator to load. Sound electrical planning, operating practices, and engineering guidelines derived from operating experience and engineering studies are the basis for the development and application of such principles which are set forth and described in Figure 1:

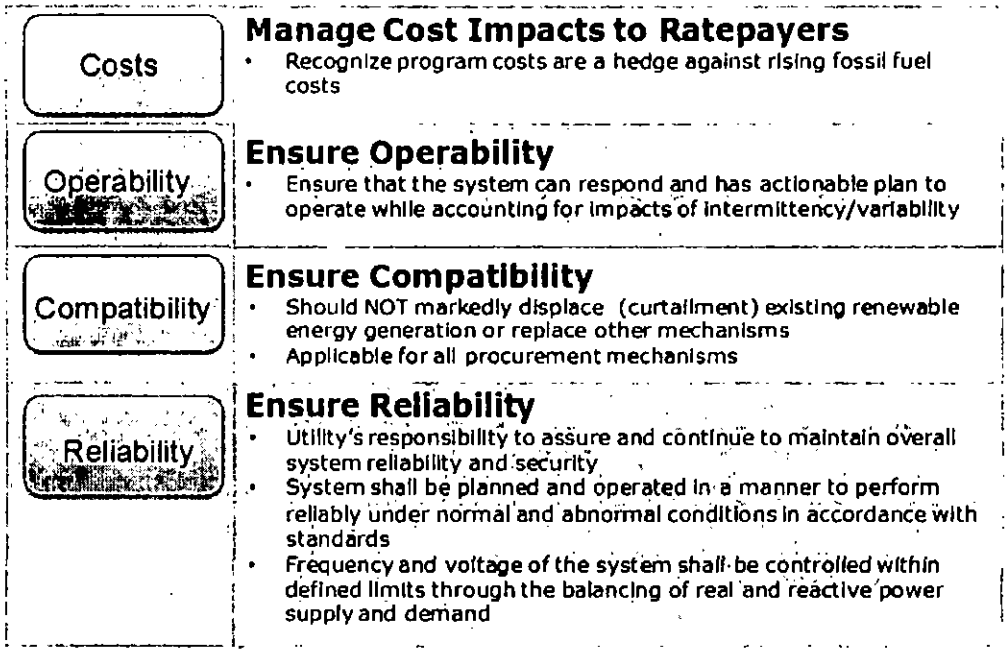

Figure 1. Proposed Reliability Standards/Principles for Aligning Operating Criteria and Shaping System Studies.

System operating criteria and actions can be aligned to each of the reliability principles ("Principles") to evaluate system integrity, operability and economics.

Table 1. Summary of Interconnected Distribution Level Penetration on Each Island Grid.

Island Grid	Net System Load at Peak (MW)	Existing Distribution Level Penetration on System (MW)	Existing Distribution Level Penetration by % of Peak System Load
Oahu	1,200	10.1*	0.8%
Hawaii	194.6	9.1	4.7%
Maui	199.9	5.8	2.9%
Lanai	4.70	2.1	43.7%
Molokai	5.95	0.3	5.0%

* 30 MW of HECO internal combustion engine DG units are also interconnected to the HECO distribution system, however they do not factor into the overall system-wide DG limit due to the fact that they are HECO dispatchable units.

E. Appropriate Studies Were Performed For Each Unique Island Grid To Determine, For Purposes Of The Initial FIT Program (2010-2012), The Approximate Level Of Additional Distributed Generation That Could Reasonably Be Integrated Without Negatively Impacting System Reliability, Ratepayer Cost, Or Curtailment Of Existing Or New Renewable Resources.

As discussed above, the Commission was clear in its Decision and Order that the Hawaiian Electric Companies "*must not interconnect projects that will substantially compromise reliability or result in an unreasonable cost to ratepayers or would lead to significant curtailment of new or existing renewable energy generators.*" (Decision and Order at 56) (Emphasis supplied). Stated another way, the interconnection of projects which substantially compromise reliability, result in unreasonable costs to ratepayers or lead to significant curtailment of new or existing renewable energy generators would be contrary to the Commission's Decision and Order. Accordingly, in evaluating and establishing the circumstances in which FIT projects can or cannot be incorporated on each island, the Hawaiian Electric Companies were cognizant of the need not to establish integration levels which conceivably could compromise reliability and instead conducted the appropriate studies to determine integration levels that reasonably assure that reliability could be maintained and resource curtailment managed.

The following is a discussion of the island-specific studies or analyses which were conducted for the purpose of developing reliability standards for each island system.

1. Oahu

As indicated on the following table, which captures known interconnected distributed resources by category, currently, Hawaiian Electric does not have a high level of penetration of distributed renewable resources on its system although that level is anticipated to increase significantly over the course of the next few years due to the FIT Program. All FIT Tier 1 and 2 resources are anticipated to be interconnected to the HECO distribution system, and it is possible that smaller Tier 3 resources may be as well.

Table 2. Existing DG, Oahu

HECO Installed DG Summary As of 12/31/09			
Type of Agreement	Variable DG kW	Non-Variable DG* kW	TOTAL
NEM and SIA Generation	9,822	300	10,122
No Sale	0	0	0
TOTAL	9,822	300	10,122
% of 1200 MW System Peak	0.82%	0.025%	0.84%

* 30 MW of HECO internal combustion engine DG units are also interconnected to the HECO distribution system, however they do not factor into the overall system-wide DG limit due to the fact that they are HECO dispatchable units.

Although it is not at the penetration levels achieved by the neighbor islands, Hawaiian Electric already has several distribution feeders with penetrations approaching 15% (a level at which it is recommended that a study be conducted to evaluate and assess additions to a circuit). Additionally, the Hawaiian Electric power plants were designed to serve base load requirements and economically dispatch to serve customer load. The units were not designed to dispatch and cycle to respond to high penetrations of variable generating renewable resources. Accordingly, if Hawaiian Electric is required to provide spinning reserves for a percentage of any additional variable resources, such as wind and solar facilities, there is a concern that the Company's existing units may not have the ramping capability or fast start up times to support the required spinning reserve requirements. Moreover, Hawaiian Electric is concerned about under frequency, voltage, and other system reliability issues which could arise as a result of any delay in the ramping of units to serve load and result in curtailment of customer load.

In order to assess the ability of the Hawaiian Electric grid to integrate additional levels of distributed renewable resources, Hawaiian Electric retained BEW Engineering ("BEW") to analyze Hawaiian Electric's distribution system and preliminarily determine the level of additional resources that the system might accept without compromising system reliability. BEW's full report is attached hereto as Attachment 1 and highlights some of the potential issues on the existing generating system that must be studied to

determine the ability of the generating system to facilitate higher penetrations of renewable resources. The report also recommends further study of distribution system operations and switching routines, as well as the dynamic response of the system through faults and contingencies under future operating scenarios, to ensure that the system remains stable under various operating conditions. Moreover, the report recommends that Hawaiian Electric complete planning and operating studies on its entire transmission, distribution and generating systems to determine the upgrades and modifications needed to support higher penetrations of variable generating resources.

Because BEW recognized that a significant portion of the studies it recommended would not be able to be completed in the time available for the development and submission of reliability standards to the Commission, BEW analyzed examples of both existing feeder loadings and the impact of distributed PV resources upon the system peak load profile to determine the potential for reliability and operating problems with higher penetrations of variable resources. As discussed in Attachment 1, BEW's conclusion is that there is the potential for reliability and operational issues with higher penetrations of variable resources and that to avoid the situations that are occurring on some of the neighbor island systems, it would be prudent and responsible for Hawaiian Electric to establish a reasonable limit on the amount of additional distributed variable generation it can integrate on its grid until additional studies can be completed to fully evaluate the impact of higher levels of penetration on system reliability.

Through its analysis, BEW has established that an initial DG penetration level of 60 MW is deemed feasible, based on high level steady state scenario analysis. Several tens of megawatts more of DG could possibly be accommodated, however additional more refined studies are needed to confirm this. HECO will conduct these studies over the course of the next year, in time to support the next FIT Reliability Standards update.

Given that existing DG on the HECO system is just over 10 MW and given that not all FIT Tier 3 resources will be interconnected at the distribution level, there appears to be adequate space on the HECO distribution system to accommodate FIT and other DG resource additions including from NEM, at least until the FIT Reliability Standards are reviewed within the next year. As discussed in greater detail below, as additional studies and initiatives are undertaken and evaluated, including but not limited to the build out of the infrastructure required to safely integrate higher penetration levels, these limits will be regularly evaluated to determine the extent to which higher levels of distributed resources can be supported and attained.

2. Hawaii Island

The HELCO system, with its high existing penetration of distributed PV, provides a case study for overall system impact issues that can occur at high levels of DG

Table 7. Summary of Proposed Reliability Standard Actions

Island Grid	System Peak Load (MW)	Existing DG (MW)	Existing Distribution Level Penetration	Proposed Action
Oahu	1,200	10.1	0.8%	Allow DG penetration to 60 MW; conduct further study over course of year to confirm ability to accommodate more.
Hawaii	194.6	9.1	4.7%	Defer additional variable DG interconnection requests, including standard interconnection agreement and NEM requests, until appropriate mitigation measures are identified and employed. Defer bi-lateral PPA negotiations.
Maui	199.9	5.8	2.9%	Defer additional variable DG interconnection requests, including standard interconnection agreement and NEM requests, until appropriate mitigation measures are identified and employed. Defer bi-lateral PPA negotiations.
Lanai	4.7	2.1	43.7%	Defer additional DG interconnection.
Molokai	5.95	0.3	5.0%	Defer additional DG interconnection.

The system penetration managed actions shown in Table 7 are proposed to proactively manage the levels of penetration of renewables on each of the island grids and implement operating practices that are aligned with the proposed Reliability Standards/Principles discussed above.

G. Development Of A Transparent Methodology To Evaluate And Be Able To Integrate Higher Levels Of Distributed Renewable Generation On The Island Grids.

As renewable penetration continues to increase with variable renewable generation resources interconnected at both the transmission and distribution levels, a more integrated process of evaluating distribution level impacts on system performance is critical, especially when potential bi-directional flow of electricity may be encountered. The figures below illustrate how distribution and transmission considerations can be integrated into the analysis for interconnecting projects consistent with Reliability Standards and Principles.

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